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Synthesis of water-soluble amino functionalized multithiacalix[4]arene via quaternization of tertiary amino groups

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Abstract

© 2018 by the authors. A convenient approach to the synthesis of multithiacalix[4]arene derivatives containing amino groups and phthalimide fragments by the formation of quaternary ammonium salts is presented. As the initial macrocycle for the synthesis of multithiacalix[4]arenes, a differently substituted p-tert-butylthiacalix[4]arene containing bromoacetamide and three phthalimide fragments was used in a 1,3-alternate conformation. The macrocycle in cone conformation containing the tertiary amino groups was found to be a convenient core for the multithiacalix[4]arene systems. Interaction of the core multithiacalix[4]arene with monobromoacetamide derivatives of p-tert-butylthiacalix[4]arene resulted in formation in high yields of pentakisthiacalix[4]arene containing quaternary ammonium and phthalimide fragments. The removal of phthalimide groups led to the formation of amino multithiacalix[4]arene in a good yield. Based on dynamic light scattering, it was shown that the synthesized amino multithiacalix[4]arene, with pronounced hydrophobic and hydrophilic fragments, formed dendrimer-like nanoparticles in water via direct supramolecular self-assembly.

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Keywords

Aggregation, Amino derivatives, Dendrimers, Multithiacalix[4]arene, Nanoparticles, Receptor, Self-assembly, Thiacalix[4]arene

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